sixth of the entire product of the United States. The two mills when in operation employs about 5,000 men. The output is 1,000 tons per day.

Scranton was the first city east of the Mississippi to adopt electric power upon street railroads and the second city in the world to use the electric motor upon a street car. The trial trips of the electric cars were made on Adams avenue, on what is known as the Green Ridge suburban line, on the last day of November, 1886, and in less than two years from that time the last car horse had disappeared from the city's thoroughfares, and Scranton became known as the "Electric City."

Scranton's geographical position has done much toward furthering her interests. Situated 146 miles from New York and 167 miles from Philadelphia, and 317 from Pittsburg, it is easy to see that it is in no danger of being checked in its growth through competition in the way of large enterprises in these thriving cities of the country. As ascertained by the United States geodetic and coast survey of 1885, Scranton is in latitude of 41 degrees, 24 minutes and 29 seconds north, and longitude 75 degrees, 39 minutes and 47 seconds west of Greenwich; and is 745 feet above the level of the sea. It is within a zone of humidity, though the rain falls are not too frequent for good health. The climate is mild and salubrious, with sufficient bracing weather to impart tonic and vigor.

NEIGHBORING GROWTH.

With the remarkable development of the past half century that has marked the career of Scranton, the surrounding towns have to a certain extent kept pace, and in localities where the early residents pursued game through the tangled thicket, flourishing towns have sprung up in a twinkling, and the pathways of the deer and fox have in many instances become the busy avenues of thriving towns and cities. The system of rapid transit, which has so materially aided these hamlets in their strides toward cityhood, as heretofore remarked, has been among the greatest boons to progress in this direction. Up and down the valley the towns and boroughs are gradually increasing and moving their limits nearer the great center which in time must gather her offspring together under one grand municipality. Some of the most thriving of these boroughs are situated in what was originally the township of Blakely. This township which, according to the eminent historian, Dr. Hollister, received its name from Captain Johnston Blakely, who commanded the United States sloop of war, the Wasp, was erected out of Providence in 1818. It included Carbondale, Olyphant, Peckville, Winton, Archbald, Throop and many other hustling villages of the valley. Archbald was a howling wilderness until 1844, and was a favorite hunting ground for the sportsmen of this vicinity. At this time Mr. James Archbald, for whom the place was named, in company with others, opened mines in that locality. From a small beginning in the way of a settlement, which consisted of a blacksmith shop and a few humble dwellings, a thriving city of 5,000 inhabitants has grown in a few years. In addition to mining industries, which are at present largely controlled by the Delaware and Hudson Railroad company, the city has many manufacturing interests which furnish employment for a large number of women and girls. The town of Winton, which is situated a short distance down the valley owes its existence to the coal operations of W. W. Winton, and was founded in 1874. Peckville, the next town in the line, which is now almost continuous from Carbondale to "Greater Scranton," is noted principally for its lumber industry, though some of the most important mining interests of Mr. W. T. Smith and other Scranton operators are situated in this vicinity. Peckville and its thriving suburb, Jessup, are among the most enterprising hamlets of the Moosic region. Peckville has good churches, schools, stores and a class of inhabitants noted for their sobriety and general thrift.

OTHER THRIVING TOWNS.

Until 1855 Olphant was indicated on the surface of the earth by a saw mill and a couple of log houses. About this time the late Lewis Pughe and Edward Jones secured leases of the coal lands in the place, and the village began to develop and the progress has been rapid and steady, and the town of Olyphant, with its various enterprises has come to be recognized as among the most important of the valley. Jermyn, Mayfield, Dickson, Throop, Priceburg, Taylor, Lackawanna and Moosic are among the other thriving towns that are in fact a part and parcel of "Greater Scranton."

The brough of Dunmore, which will probably be the first to become a portion of "Greater Scranton," was first known to the business world in 1820, when a store was opened at the "Corners." It was known in those days by the unpoetical title of "Bucktown." This little village which consisted of a tavern and a few houses remained as a rounding up place for lumbermen of that region until the operations of the Pennsylvania Coal company began when a change came over the place, and the influx was composed of a better class of inhabitants. Schools and churches soon became institutions of "Bucktown" and in a few years the inhabitants began to feel themselves above the homely name and the present title of Dunmore was adopted. Indeed it may truly be said that the Pennsylvania Coal company is the parent of Dunmore, and also that much of the prosperity of the borough is due to the enterprise and public spirit of the late efficient head of the company, the lamented John B. Smith and his worthy successor and son, Mr. George B. Smith, who is at present in control of the interests of the company, which extend from Pittston to Hawley along the line of the Erie and Wyoming Valley railroad.

A CHANGE OF SCENE.

In mentioning the busy towns that should be included in the great municipality, which is the dream of all public-spirited citizens, the beautiful hamlets on the line of the roads running north and south should not be forgotten. The bird-eye view of the stretch of country seen through the Notch or from the eastern crest of the Moosic range, presents a scene entirely different from that of the bustling industrial and mining towns up and down the valley. Looking north a picture of tranquility greets the eye. The grimy breakers and black smoke stacks have disappeared. In summer time the rolling meadows, fringed with woodland, afford a view that is ever delightful to the lover of the beautiful in nature. Along up a beautiful valley, where daisy-flecked fields and luxuriant gardens slope from wooded hilltops to limpid streams that ripple lazily on in their journey toward the Delaware bay, the little hamlets of La Plume, Dalton and Glenburn nestle in emblematic serenity, the ideal specimens of the pastoral village, while further down, almost within sight of the Scranton arc lights at nightfall, is situated Clark's Summit, which has recently been the point of interest to those engaged in real estate speculations on account of the parks that have been established there by land companies, calculated for suburban homes for Scrantonians. The villages above mentioned have become very popular as summer homes, and many residents of Scranton pass the greater portion of of time amid these pastoral scenes each year from May to October. Within a few minutes east is situated Elmhurst, a delightful suburban home town, which through the enterprise of Colonel U. G. Schoonmaker has come to be one of the garden spots of this locality. Elmhurst has a fine hotel and many elegant summer homes which are owned by Scranton business men. Many of the property owners at Elmhurst reside in the place the year around, while others spend the winter in the city proper.

In addition to train facilities, Elmhurst may be reached from Scranton by a boulevard, which is absolutely without a peer in this part of the country, and is one of the enterprises that has done much to advertise Scranton as the home of progress. The Elmhurst boulevard is approached through Nay Aug park and its course is upon a mountain top for a distance of nearly eight miles. The scenery along the route is delightful and the thoroughfare is one of the popular driveways of this part of the state.

RESULT OF IMPROVEMENTS.

It is becoming more and more recognized that there can be no more profitable investment than to make a city beautiful. Every dollar spent in this manner is sure to bring large returns as an enterprise. The greatest profit comes from beautifying a city in the satisfaction that one takes in the contemplation of improvements, and the development of the character of a community; but even from a purely financial standpoint the investment of funds in this way can be regarded as a profitable venture. Scrantonians of a few years ago have fully realized this fact, and various land companies have vied with each other in the creation of delightful parks intended as localities for suburban homes, and experience has shown that they made no mistake in appealing to good taste of buyers by making their plots as attractive as possible. The work of the landscape gardner and florist has brought forth generous returns in every instance, and as the city grows beautiful none murmur at the rapidly increasing price of real estate. Scranton has been lavish in the expenditure of funds for civic beauty; and the returns will be forthcoming hereafter.

CITY GOVERNMENT.

A Glance at the Workings of the Great Municipality -- List of the City Officials.

The City of Scranton was incorporated April 23, 1866. The city proper covers an area of 19.06 square miles and the raveled streets would reach a distance of 116.26 miles and the courts and places 26.55 miles. The organization of the city government was effected by the election of E. M. S. Hill mayor, who served from 1866 to 1869. His successors in order were as follows: W. N. Monies, 1869-72; M. W. Loftus, 1872-75; Robert H. McKune, 1875-78; T. V. Powderly, 1878-1884; Francis A. Beamish, 1884-1886; Ezra H. Ripple, 1886-90; John H. Fellows, 1890-93; W. L. Connell, 1893-96, and James G. Bailey, the present incumbent, elected in 1896.

The destinies of the city are directed by two representatives from each of the twenty-one wards, who meet in select and common bodies twice each month. The terms of office of the members of the select council from all even numbered wards expire on the first Monday of 1898, and in odd numbered wards in 1900. Terms of members of the common council from odd numbered wards expire on the first Monday of April, 1899, and the even wards on the same day in 1898. In the matter of qualifications select councilmen must be 25 years of age and common councilmen 21 years old, and shall have been citizens and residents of the state for at least four years, and of the ward they represent one year next bfore their election. Unless absent on public business of the United States or of the state of Pennsylvania, they shall reside in the ward during their term of office.

The edifice devoted to the use of the councils and various municipal officers is most spacious and convenient as well as artistic in design. The handsome new city building at the corner of Washington avenue and Mulberry street, as shown in the illustration elsewhere, is a model of completeness in interior arrangements and in exterior beauty, and is arranged to afford ample accommodations for business transactions in the interest of the city for years to come. The building contains spacious meeting rooms for the common and select branches of the councils which, on occasions when a joint session is required, may be thrown into one immense hall. In addition are meeting rooms for the school board, the poor board and public and private offices for the different officers in the service of the city. These apartments are furnished in a luxurious manner and are provided with every convenience necessary to the transaction of official business with dispatch. In the basement is situated the headquarters of the police department, and the cells of the city lockup.

An important feature in the conduct of the affairs of the city is the electric fire alarm system, which is maintained by the Central Pennsylvania Telephone company. The system embraces seventy-eight signal boxes. Rent of the system and the cost of maintainence for the year 1897 amounts to $3,550.20. Electric street lights are furnished by the Scranton Electric Light and Heat company, and the contract price is twenty-five cents a light per night for all night and for every night in the year. The number of lamps in use at present is 554.

The street cleaning department, while not at perfection by any means, has been greatly improved within the past few months, and with the employment of a larger force of men, might, under the present system, be made second to none.

The fire department, which is rapidly approaching the state of paid system, is probably one of the best volunteer organizations known in the commonwealth. Sixteen companies are on the list, and many of them employ two permanent men each on salary; and the time is probably not far distant when the entire department will be paid.

Much attention is given to building ordinances, and though the work of the class of builders who disfigure the streets with little one-story shells and other unsightly edifices is difficult to deal with, a fire limit has been established in the central city to prevent the endangering of valuable property by the erection of more inflammable wood structures.

The city is fortunate in having a board of health that is unusually active in their labors for the good of the community and the excellent sanitary condition of the city is doubtless due largely to the activity of the officers of the board.

The officials of the city of Scranton are as follows:

Mayor—James G. Bailey; mayor's secretary, R. J. Beamish.

City Treasurer—C. G. Boland; clerk, P. J. Ruane.

City Controller—Edmund J. B. Robinson; clerks, Edward Eisle, Charles G. Rosar.

City Solicitor—M. A. McGinley; assistant, Michael J. Walsh.

City Clerk—M. T. Lavelle; assistant, Evan R. Morris.

Building Inspector—John Nelson.

Street Commissioner—A. B. Dunning, jr.; clerk, John P. Mahon.

Chief of Police—Frank Robling, jr.

Chief of Fire Department—P. J. Hickey.

City Engineer—Joseph Phillips; assistants, E. B. Sherwood, W. H. Sadler, D. J. Healey; clerk, Franklin Phillips.

City Assessors—C. S. Fowler, William Dawson, Charles Fickus.

Board of Health—Dr. W. A. Paine, president; Dr. J. K. Bentley, George S. Horn, H. J. Zeisler, M. J. Kelly.

Health Officer—Dr. W. E. Allen.

Secretary—Robert Murray.

Sanitary Policeman—W. H. Burke.

Food Inspector—Thomas J. Cullen.

Poor Board—

Directors—W. S. Langstaff, Frederick Fuller, F. L. Treppe, Dr. W. A. Paine, P. J. Murphy, Thomas Shotten, Reese G. Brooks.

President—W. S. Langstaff.

Secretary—E. J. Lynett.

Treasurer—John Van Bergen.

Collector—Wade Finn.

Solicitor—John Scragg.

Superintendent—B. G. W. Beemer.

Matron—Mrs. G. W. Beemer.

Resident Physician—Dr. Strang.

School Board—

The school board meets the second and fourth Mondays of each month. The officers are as follows:

President—T. J. Jennings.

Secretary—Eugene D. Fellows.

Superintendent of City Schools—George Howell.

Solicitor for Board—H. A. Knapp.

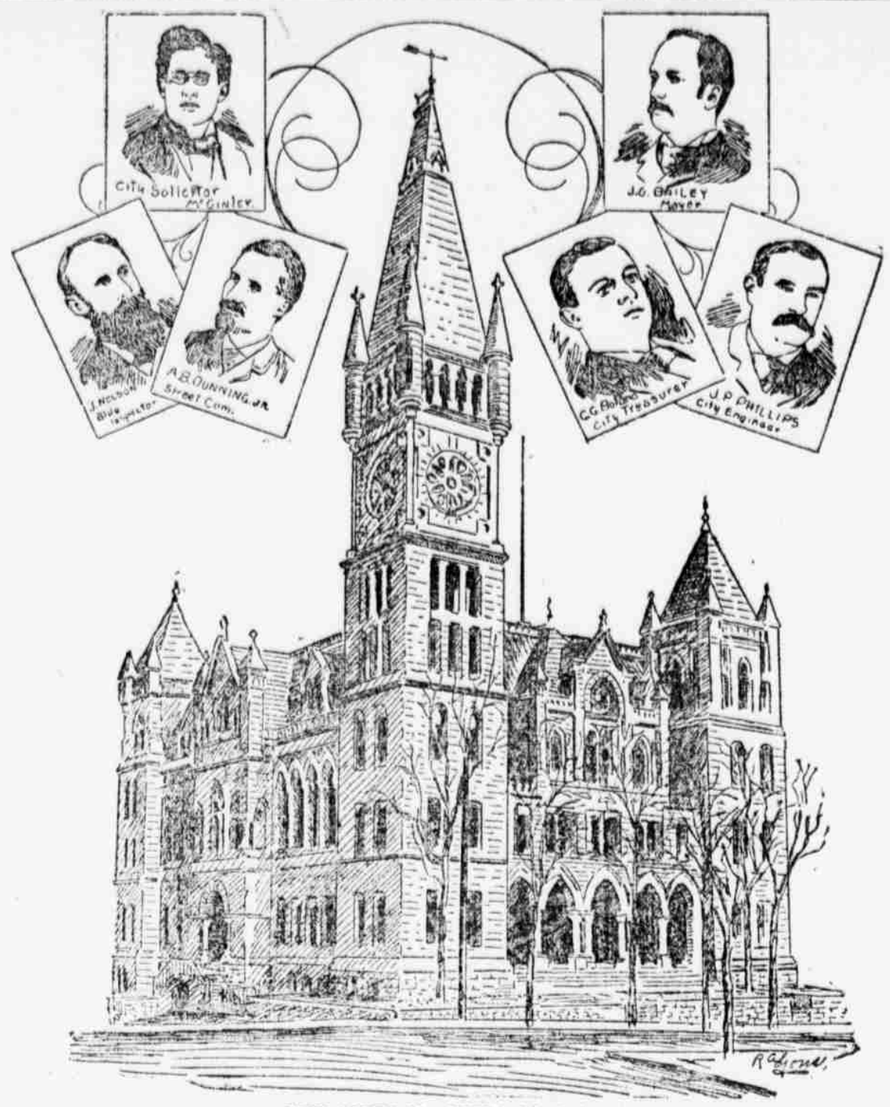
EDUCATIONAL TOPICS.

Magnificent School Buildings and Efficient Teachers--The Albright Library.

The educational facilities of Scranton are second to none in inland cities. Numerous school buildings are located at convenient points about the city and the elegance of the structures that are designed for convenience and comfort is proverbial.

Some of the narrow-minded have shown a disposition to find fault with what they deem extravagance in the construction of school buildings, but fortunately this spirit is confined to but a small percentage of our citizens. The average Scrantonian is of the belief that the best is none too good in school edifices and appliances and the beauty of the city school buildings therefore has been the cause of comment on part of visitors and newcomers. Thirty-seven elegant school buildings are included in the city's property, and last year nearly 13,000 pupils received instruction in the various departments. The High school building, which is situated at the corner of Washington avenue and Vine street, is one of the most expensive as well as the handsomest buildings of the kind in the country. In addition to the advantages to be gained from a higher course in this building a training school for teachers is also in operation. The school buildings about the city are in charge of teachers of experience and ability who have the interests of pupils at heart and are possessed of energy that enables the school interests of Scranton to keep in line with progress generally.

An important factor in education in Scranton is the Albright Memorial Library, which was established through the generosity of the heirs of the late Joseph J. Albright. At a meeting of the Scranton Board of Trade held on the 27th of January, 1890, President Smith announced that the heirs of Mr. Albright had donated to the city for the purpose of a public library the plot of ground upon which the Albright homestead stood at corner of Washington avenue and Vine street and that upon this ground so deeded, Mr. Joseph J. Albright, jr., proposed to erect a building at the cost of $50,000 to $75,000, for use of such library. The meeting was addressed by several members of the board who united in congratulating the city on securing such a magnificent gift and suitable resolutions were introduced by Hon. Alfred Hand, and also a letter of acceptance written on behalf of the board. A meeting was called soon after and large sums were raised for the purchase of books. The work upon the building was commenced in the May following the acceptance of the gift and was pushed rapidly to completion, and about three years from the accentance by the Board of Trade the beautiful library was opened to the public. The estimate of the original cost was gradually increased as the building drew near completion by the generous donors until the sum expended exceeded $125,000. The Albright Library building is today a model of architecture that has never been approached in this part of the state and its sheves are filled with the works of the well known authors and scholars and contain an unlimited fund of information for the young of inquiring minds. The library is a most popular institution with both young and old. Its reading rooms are thronged daily with bright young visitors and the transactions of the loaning department seem almost marvelous.



SCRANTON CITY HALL.

COAL INTERESTS.

The Product of Pennsylvania Anthracite Basin the Finest in the World -- Cheap Fuel for Steam Power.

The danger, labor and expense incurred in the mining and preparation of anthracite coal for market is realized by few people who use coal for domestic purposes or for the generation of steam. Even in the home of the coal industry not many persons comprehend the magnitude of the undertaking, and were it not for the improved machinery that has been utilized of late it would be impossible to mine coal at a profit at the present prices. Many are perhaps also ignorant of the fact that the entire supply of anthracite coal for the world comes from Eastern Pennsylvania, the coal belt extending to Lackawanna, Luzerne, Schuylkill and Carbon counties. Small beds are also found in Sullivan county and on the borders of Wayne and Susquehanna. But while immense quantities of anthracite are shipped from the lower coal beds of the belt it is probable that the Scranton product leads all others in quality. In the markets of the world the coal from the Lackawanna has a reputation for purity and freedom from other minerals also that makes it much sought for, especially for domestic purposes. Strange as it may seem, the best beds of coal for domestic purposes have thus far been found on the west side of the Lackawanna river, and so thoroughly have these beds been worked over, it is stated that were a few feet of barriers removed between the different mines, one could walk from Priceburg to Taylor under the city of Scranton, a distance of seven or eight miles, through the various workings without coming to the surface. From a point on Petersburg Hill, near Laurel Hill Park, twenty-two coal breakers appear in view up and down the valley within a distance of five miles. These black, uncouth shafts that mar an otherwise beautiful landscape, though not pleasing to the vision of the aesthetic, are dear to the hearts of the people, as they stand out against the clear skies, monuments of the industry that affords employment for thousands, and the fountains from which the enterprises of Scranton draw life.

Anthracite coal is mined by two methods. In the early days of coal digging in the Lackawanna valley, when the product cropped out from almost every ledge of rocks hereabouts, the slope mining, which is least expensive, was the mode employed. A vein of coal which blossomed out on the mountain or hillside, was followed by a tunnel, and the coal was taken out in little cars, which were drawn by donkeys or were allowed to be propelled by their own weight down a slight incline in the drift. A number of operators in this vicitiny who work on a small scale and mine coal for domestic purposes, still work in slopes. The richer veins, however, are reached by the shafts, which are sunk hundreds of feet below the surface.

The coal basin of the Lackawanna region contains seven veins, varying in thickness and depth. The first is called the diamond vein. This is situated at a depth of about 100 feet, and frequently crops out on the surface. The diamond vein is usually about seven feet thick. Sinking the shaft another hundred feet the rock vein which is about 10 feet thick is found. At a depth of 80 or 100 feet below the rock vein is reached the mammoth deposit, a vein usually 14 feet in thickness, containing a dividing layer of slate about 18 inches thick. Proceeding 120 feet further towards the bowels of the earth the miner strikes what is known as the Clark vein, which is usually about six feet thick. One hundred feet below the Clark vein is found a layer of very fine coal from four to five feet in depth which is called in this vicinity the Dunmore vein, but is known elsewhere as red ash coal. The red ash is the lowest vein that can be mined with profit. A six inch vein is often found by drillers below the red ash vein, but it is seldom worked.

THE CULMN PROBLEM.

The disposition of culmn waste is a problem that has puzzled the scientists for years. In seasons of the past tons and tons of excellent fuel went to waste upon the culm banks. With the improved grates for burning small sizes of coal much of the coal which was wasted in former years has been utilized under the name of pea and buckwheat coal. The pea coal is the most economical for the kitchen range, containing as it does a greater percentage of the pure carbon than the larger sizes; and for steam generating purposes the buckwheat the next size smaller, is in great demand. By the introduction of culmn-burning locomotives the railroad companies have been enabled to dispose of immense quantities of what would otherwise have been waste material, and the numerous washeries, where the contents of the dump are screened and assorted into small sizes for domestic purposes, have had the effect of utilizing the waste to a certain extent. Yet the culm problem is practically unsolved, unless perhaps the scheme of Mr. Gardner Sanderson, which is explained in another column, proves practical.

The much-talked of tariff on coal does not directly affect the anthracite interests. There is no duty on anthracite coal. Pennsylvania is practically without competition in this product. The only way that anthracite would be seriously affected would be by a flood of Nova Scotia soft coal to this county which would glut the eastern markets and probably take the place of small sizes of anthracite in the big manufacturing concerns, where it would be used for steam generating purposes. For domestic purposes the smoky bituminous product can never successfully compete with the clean-burning dusky diamonds of the Eastern Pennsylvania anthracite coal fields.

The statement that Scranton possesses the best, safest and cheapest steam power fuel in the world is borne out by contemplation of the facts in the case from a standpoint of intelligence. By the sheer effort of advertising the world has been taught that the natural gas is the cheapest fuel for steam generating purposes, and many accept the assertion without stopping to investigate the subject. In contemplation of the advertisements of the enterprising trade boomers of the natural gas regions they lose sight of the fact that the best fuel in the world is available in the Lackawanna valley, and that the unsightly culm piles contain the motive power to turn the wheels of industry for years to come. An explanation of test given in the report of the Scranton Board of Trade for 1890, show conclusively the superiority of the anthracite coal for steam-generating purposes, and also show that the excellent material is cheaper as well as safer and more reliable than the much-vaunted natural gas, which is liable to fail or wreck a manufacturing plant at any time without warning.

Under the vast mountains of what was at one time considered waste coal is concealed the product that is to be of great value to business and manufacturing interests of the future.

Though invention is yet in its infancy in the matter of grates for the utilization of culm, it has already been demonstrated that much if the fine coal which can be purchased for a song, can be used to good advantage in mnufacturing.

An estimate of the cost of the various kinds of fue used for steam generating purposes is given in connection with the above. And taken generally it may be safely stated that fuel per horse-power per boiler costs each day as follows:

Anthracite coal, prepared sizes, 5 to 8 cents.

Bituminous coal, from 4 to 6 cents.

Natural gas, from 3 to 5 cents.

Culm, from ½ cent to 2 cents.

The idea that culm must be fresh to be of value has been exploded effectually by the operations of the washeries where excellent coal is turned out from dumps that have been exposed to the storms of many winters.

The coal interest of the valley at the present time are largely controlled by the Pennsylvania Coal company, the D., L. & W., and the D. & H. Railroad company. Among the operators who have assisted materially in building up the industry in Scranton may be mentioned Mr. William Connell, Mr. W. T. Smith, Mr. W. H. Richmond, Messrs. Simpson & Watkins, West Ridge Coal company, Enterprise Coal company. These operators have been foremost in all enterprises calculated to promote trade and better the condition of the miners in this region.

FUEL GAS FROM CULM.

Valuable Invention Calculated to Reduce Cost of Motive Power.

The value of gas for fuel and power is no longer problematical, it is practically demonstrated to be of much greater value than the solid fuel from and with which it is produced.

The well known Siemens regenerative furnaces had much to do with its application for high heating purposes such as melting iron and steel, but for moderate heating, simply furnaces without provision for fire heating the air or gas is used. For boiler firing where steam is a necessity it is found to be much more effectual as it is more convenient than solid fuel, and is an improvement upon any automatic stoker possible to devise. For domestic purposes its value is recognized and even where expensive illuminating gas is the only kind to be had, it is being so extensively used as to seriously curtail the use of coal. But probably the most valuable of all the various purposes to which it is applied is that for furnishing power by means of the gas engine. This country is a long way behind the European countries in the utilization of this most economical of power generators. There the gas engine is employed for all power purposes and is rapidly displacing the steam engine. It is in common use for pumping water for town supplies, electric lighting and railway plants, mills employing from 100 to 1000 horse power, and for all other purposes requiring power.

The advantages of gas engine power may be thus enumerated—Economy of fuel, safety from boiler explosions, saving of boiler expenses and dirt, saving of water and little importance as to quality, no high pressure retaining vessels or pipes, no escaping steam, no complicated system of safety valves, guages, feed water heaters, condensors, separators, pumps &c, no waiting to get up steam or waste when engines are not running.

An American writer of authority on the subject of power, says, "after careful and intelligent tests by experts with the best instruments made at the present day, it is generally admitted that what is now deemed the perfect steam engine, does not convert more than 10 per cent. of the heat efficiency into indicated work and that ordinary engines and boilers do not realize over 4 per cent. From 90 per cent. to 95 per cent. of energy is lost in the wasteful method of producing steam through a boiler and the condensation and friction in conveying it to the piston of the engine where the energy is expended in work. If we can compare this with the effective energy produced by the expeansive force of heated vapor produced by the combustion of gas in the cylinder of a gas engine without any intervening throttling by friction, cooling and condensation, or loss by radiation, we readily discover the great economy of the gas engine as a prime motor. It is only a matter of time when the prejudice that usually exists against an innovation will be overcome and the superiority of the gas engine over the cumbersome short lived and wasteful boilers will be established. The cost of producing power will be so reduced, that the beggar may ride, and in the next decade the steam engine will occupy the same relative position to the gas engine that the tallow dip now does to the electric light, and the horse car to the electric car."

Mr. Thwaite, an English engineer and authority says: "In the gas engine 3-4 of the combustible value of the fuel is secured in the cylinder for direct conversion into power under the most perfect conditions of combustion. In the steam plant, this fuel is burnt under the worst possible conditions in the furnaces of the steam boiler of the best designed," which factor is greatly reduced by condensation, resistance, waste &c., in pipes before reaching the cylinder of the engine. He also says a central coal field gas power installation, will permit dynamic energy to be produced for transmission by high pressure alternating electric currents, to a distance up to one hundred miles, at a cost that would bring this energy well within the limit prescribed by the expression of cheap power."

Mr. Donkin another English authority says: "It has now proved that a good gas engine turned about double as much heat into work as a good steam engine." Also that "it has been found and attention was first drawn to the fact by Sir W. Siemens, that coal gas gives much more light when furnishing power electrically through a gas engine and dynamo than when the same quantity of gas is burnt in the ordinary way" as an example. An engine using 15 feet of 16 candle-power gas for each horse power per hour will run ten 16 candle power incandescent lights or 160 candle power of light for one hour. This gas will furnish three 5 feet burners giving 16 candle power each or 48 candle power of light for one hour or a gain of 112 candle power of light from 15 feet of gas by conversion into electricity. In producing are lights 12 times the light is obtained from the same gas consumption as in producing incandescent lights.

The natural gas found in some parts of this country has had much to do with the rapid development of its uses for fuel and power, where nature's supply has been exhausted manufactured gas has been restored to rather than return to the use of solid fuel, even in the soft coal region.

Millions of dollars are being expended in the development of water powers for the purpose of generating electricity which has generally to be conducted a long distance by means of expensive conductors and with great loss of efficiency, to reach the place where the power is to be applied.

Scranton and vicinity possesses an unlimited source of the cheapest power in existance. The gas generated with anthracite culm by the Sanderson process is chemically the same as that most generally used for extensive power purposes in Europe, and which is also produced with anthracite coal, prepared sizes being required; we therefore have the results of practical experience with the same quality of gas used in the engines of various descriptons, single and double acting, vertical and horizontal, tandem and compound, developing up to 700 H. P. and employed for a great variety of purposes. Authoritive tests are attainable of the actual power developed with this gas and from the coal with which it is produced, comparing these tests with the results attained at the experimental plant of The Anthracite Gas Producer company in Scranton, and it is found that one pound of culm will produce sufficient gas to develop one H. P. per hour in a gas engine, estimating the cost of culm in the gas producer at 25 cents per ton and we find that we are able to furnish unlimited power near the culm piles at a fuel cost of 125-10,000 of one cent per horse power per hour, or for ten hours at a cost of 125-1000 of one cent per horse power or 100 horse power for ten hours at a cost of 12 1-2 cents. Considering the comparatively small outlay necessary for erecting a gas plant which will furnish power equal to that at Niagara or any other hydraulic plant, and it is evident that the the anthracite regions can furnish the cheapest power known. The other advantages of cheap gas for fuel should be considered, especially by manufacturers requiring controllable heat. As for illumination, if, as is demonstrated electric lighting can be furnished by means of the gas engine, cheaper than the light from the same amount of gas burnt direct, it is not conceivable that any one would prefer to burn gas, but if they should the Welsbach or other incandescent burners can be used with this cheap gas.

Electricity has already been successfully installed as the motive power on several steam railways and it is more than probable that its very general adoption will soon follow.

Considering the low cost of electrical generation in the anthracite coal regions the cost of transportation should be reduced to a point far below what has heretofore been dreamed of.

J. Gardner Sanderson.

Providence Water Supply.

An instance of the development of large interests from small beginnings is given in the career of The Providence Water company. Twenty-nine years ago when the company built its first reservoir, its principal intention was to supply the coal works of the Delaware and Hudson Canal company and Delaware Lackawanna and Western company. As the wells in the town however began to show signs of failing, applications were made to the water company by citizens of the vicinity who desired the water for domestic use. Only a few years elapsed from the time the company began to serve private property-holders before the demand became so great that it was necessary to build a larger storage reservoir in order to furnish a supply sufficient to serve the many patrons of the corporation. A new storage pond was therefore arranged seven miles above the town, where a sufficient quantity of water can always be kept to meet all emergencies. Water from this pond is conveyed to the original reservoir by a natural creek, from whence it is piped to the city water mains. This creek for a time ran alongside the turnpike and whenever it rained the wash from the road polluted the water. In the spring of 1893 other arrangements were made to better the quality of water by means of filters and additional mains. At what is known as the high service reservoir was built a filter house 70 feet long; 12 feet wide and 12 feet deep. The water comes through two wooden gates into the house and through galvanized screens and then over horizontal bars that can be easily removed when it is necessary to remove the acculation that covers them. After passing the bars the water encounters large crates of charcoal and passing further on drips through a series of double screens of light cloth. The screens are removed three or four times daily and are washed off with hose. A track and travelling pully arranged above enable the attendants to handle the screens and charcoal easily. Beneath the filter-house is a sediment chamber which is arranged to carry off any deposit that may accumulate on the perforated iron floors of the building. The water enters the high service reservoir through a 24-inch terra cotta pipe, beginning 4,000 feet above the point that the creek from the storage reservoir join. Along the line are five agitating pools built of stone and cemet. The force of the water through these pools turns a wheel which churns the water to foam before it passes out and acts as a fan to force the air through the terra cotta pipe above the stream. A small house with a stack and vent pipe is built over each pool.

These improvements were made under direct supervision of the company's superintendent, Major J. B. Fish, and were according to plans devised by the superintendent. Since the completion of the filtering house and the new reservoir, the quality of water has been excellent and the company has received the endorsement of the Scranton board of health in recognition of the sanitary condition of its supply.

The providence Water company supplies 7,000,000 gallons to the city daily and has a stock supply of 843,000,000 that may be drawn upon at any time. In order to bring the quality of the water to the present high standard of excellence it was necessary for the company to purchase a large amount of property in the vicinity of Chinchilla which had been used for purposes that would in spite of every reeaution be apt to taint the water. But the company had spared no expense in this matter, preferring at any cost to serve patrons with a supply of water that would be pure and healthful.

Knitting Mills.

In this region noted for its coal and iron industries, far from the localities that usually control cotton and woolen manufacturing interests, one would scarcely expect to find an establishment of much importance in the line of woolen manufacturies. Yet Scranton is the home of plants that turn out immense quantities of the best quality of modern knit goods of every description. The celebrated Lackawanna Knitting Mills are provided with every facility for economic accomplishment of every operation in connection with the manufacture of knit woolen underwear, and the transformation of the raw wool from the sheep folds of America and Australia into handsome finished garments is both rapid and accurate, producing the best effects and superiority in the matter of durability. The plant of the Lackawanna Mills is one of the most important in the country, and its patrons are distributed from Maine to California. Its products are fine and medium underwear for men, women and children and the goods shipped from the establishment have no superior in American trade. The success of this great manufacturing interest it is probable will stimulate other enterprises of the kind which by furnishing employment for our people help to build up the progressive electric city.

There is no question that the knitting industry which a few years ago was considered an experiment has come to stay.